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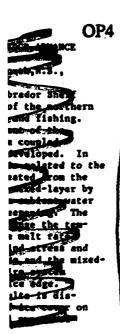
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. Thermodynamic are never, including leads, has been cooperation a one-dimensional oceanic mixed layer model in order to investigate the upper ocean-sea ice interactions. The oceanic heat flux at the base of the ice layer $(f_{\mathbf{k}})$ is predicted, not imposed, assuming a thermodynamic equilibrium between the bottom of the ice and the water just below. for the testing of the model, the annual cycle of the Artic sea ice and upper ocean is simulated along longitude 169.5°W. The model produces a realistic evolution of the sea ice thickness and extent and of the upper ocean salimity and temperature profites. The major defi-ciencies in the simulation are linked to the absence of ocean and ice dynamics. The modeled value of the far from being constant. Below thin ice, it can be larger than 5 mm due to the important fraction of the solar irradiance that is transmitted through the ice, absorbed in the mixed layer and then returned to the ice. Below the thicker perennial sea ice, Γ_b takes values comprised between 0 and 2 W m 2 and exhibits a well marked annual cycle : it is maximum in March appril and vanishes during the summer months. It is also found that the changes of the sea water freezing temperature due to changes of salinity have an important effect on $F_{\overline{b}}$ and on the vertical density profile of the upper ocean.



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A NUMERICAL MODEL STUDY OF SEA ICE IN THE BARENTS SEA

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The dynamic/thermodynamic sea ice model designed by Hibler (Hibler, 1979, J. Phys. Oceanogr., 9: 815-846) is applied to the Barents Sea and the eastern half of the Kara Sea. Open boundaries exist between Spitzbergen and Norway, Spitzbergen and Franz Josef Land, Franz Josef Land, Franz Josef Land Novaya Zemlya and Novaya Zemlya and the Soviet coast. Monthly mean geostrophic ocean currents and oceanic heat fluxes from the Hibler-Bryan (1984, Science, 224: 489-491) ice ocean model are used as oceanic forcing. Atmospheric models were used to provide the surface stress and heat fluxes for the model. Model grid resolution is 25 km and a 6 hour timestep is used.

Tests are performed using two different boundary conditions. In the first case, the model uses boundary information from a coarser resolution Arctic basin model. In the second case, boundary conditions are applied which allow ice to exit from the basin if the drift indicates there is outflow or if drift indicates that there is inflow, a constant value of ice thickness is added at the inflow boundary.

A comparison is made between model results forced by a coarse resolution atmospheric model (400 km), the Naval Operational Global Atmospheric Prediction System (NOGAPS) model and by a Operational Regional Atmospheric Prediction System (NORAPS) model. Model results show good agreement between predicted ice edge advance and retreat when compared to the ice edge analysis from the Navy/NOAA Joint Ice Center and the Norwegian Meteorological Institute.

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